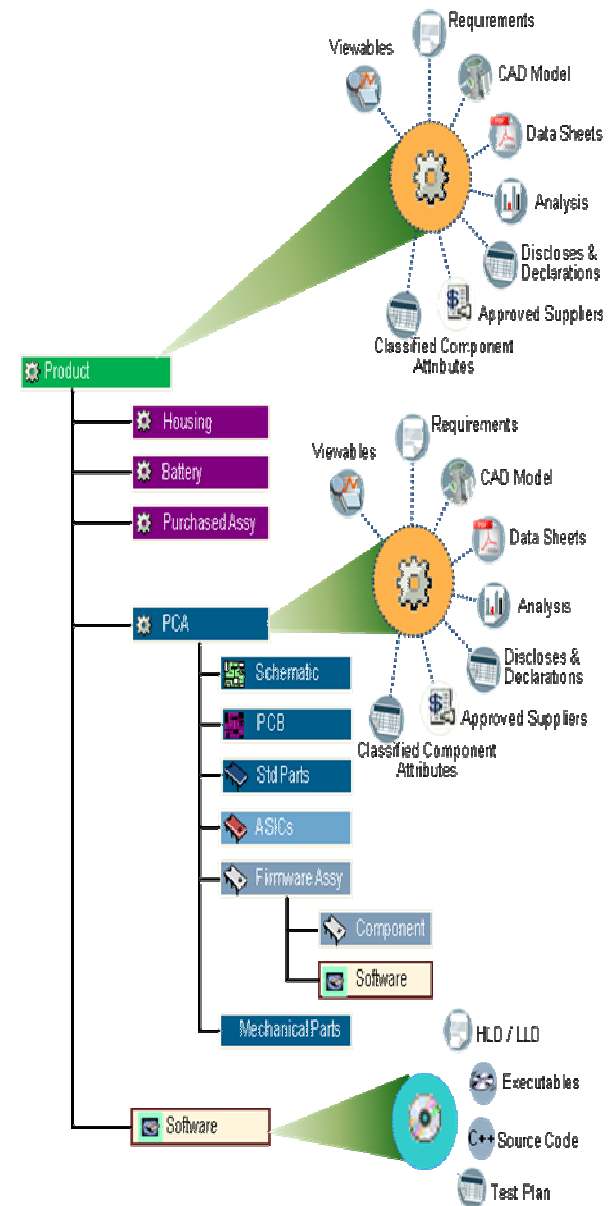


PDMLink/ProjectLink Uniqueness Solution

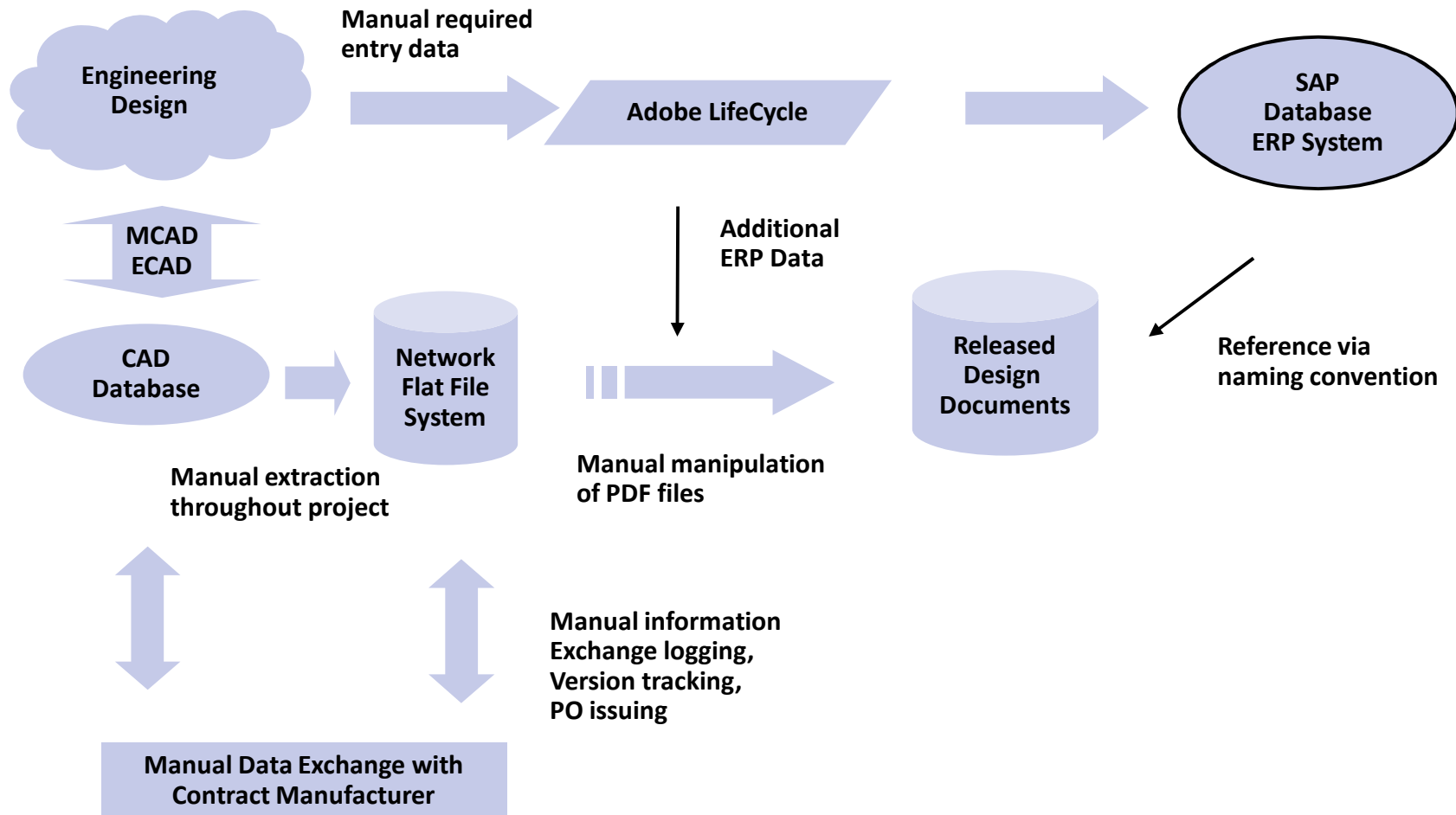
Focused on WTPart, WTDocument
and EPMDocument

Objective

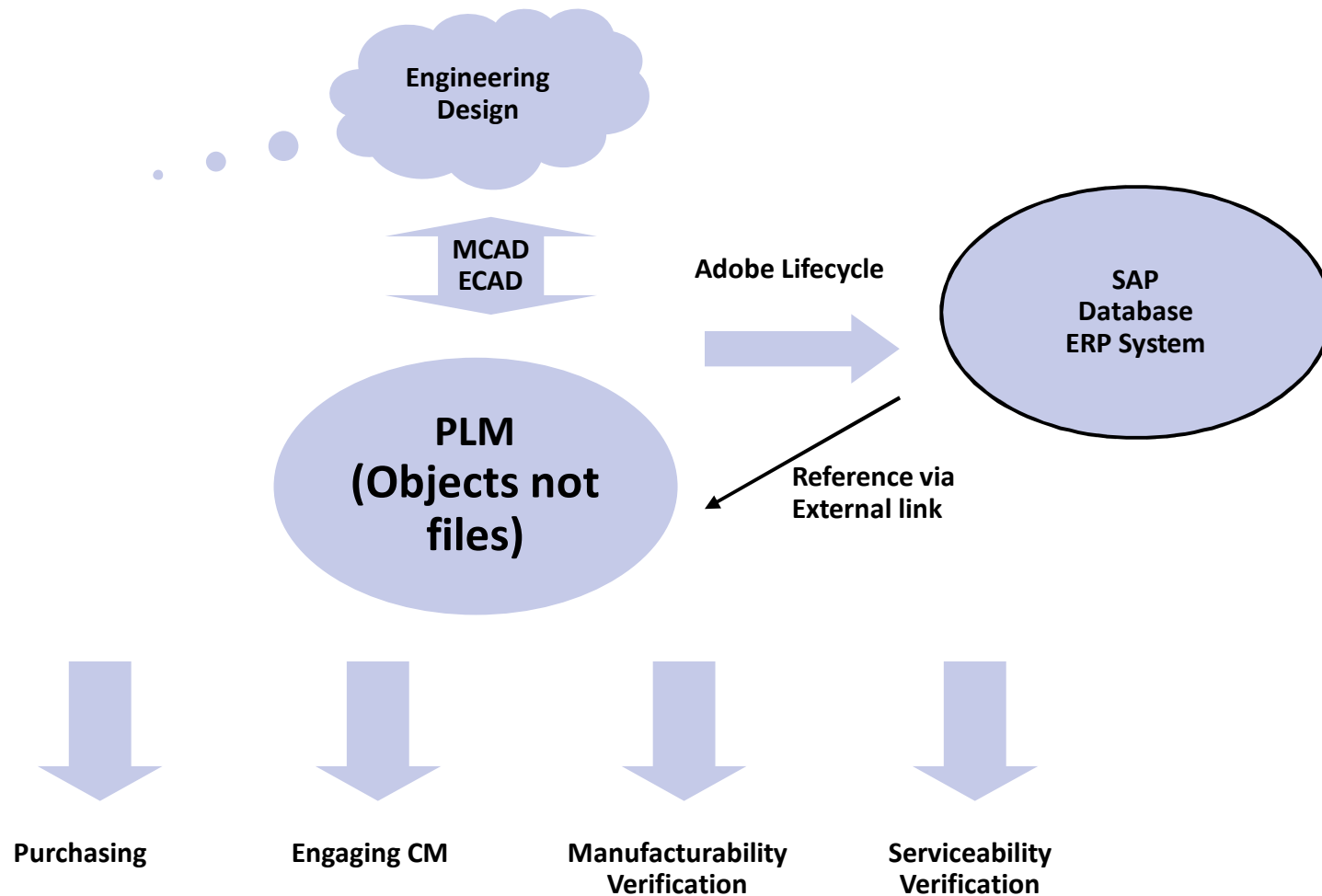
A “to be” vision of a complete business system encapsulating ERP and PLM systems integrating multiple forms of CAD data.



Current Process



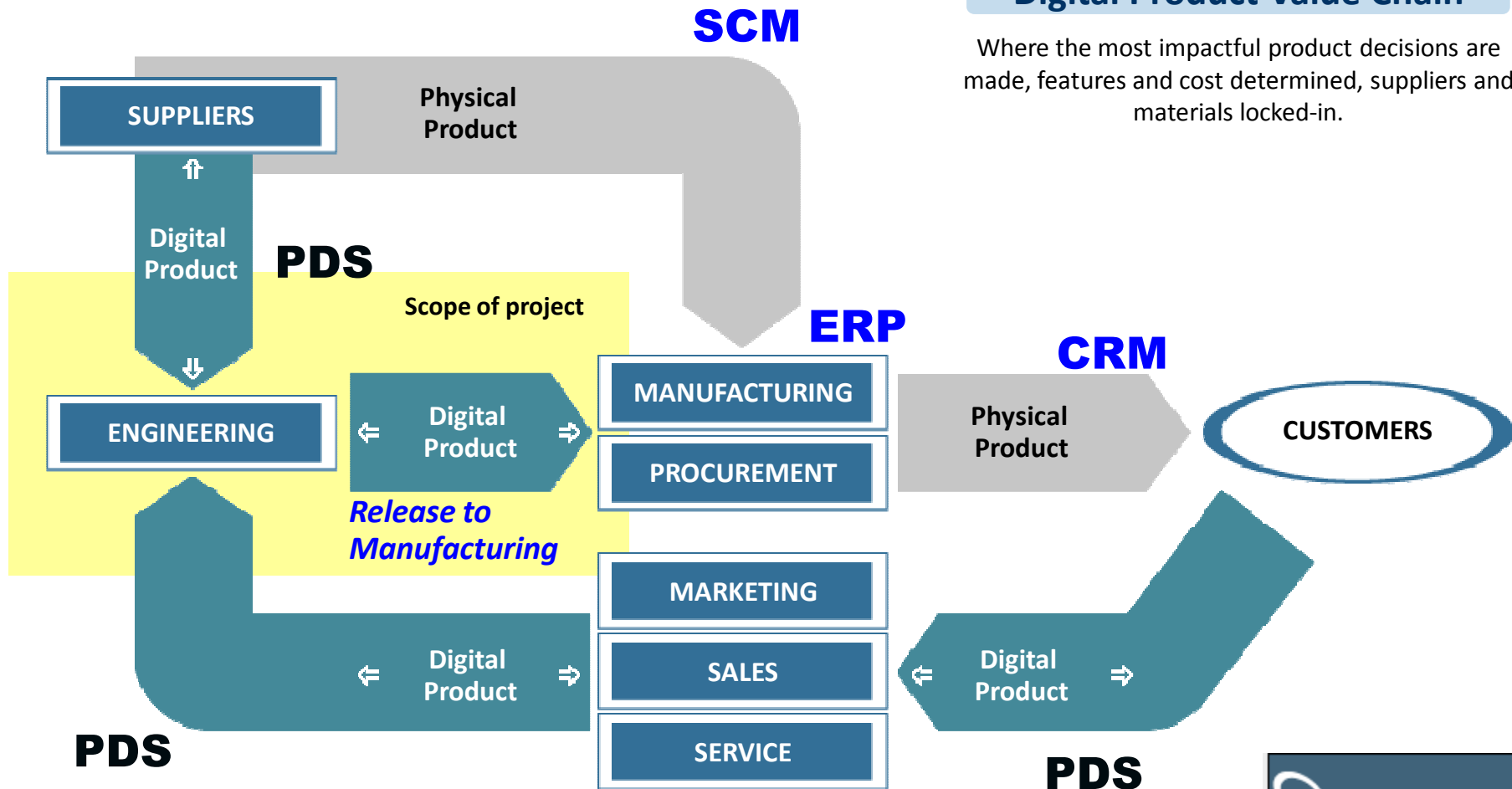
Process After Stage 2 with PLM



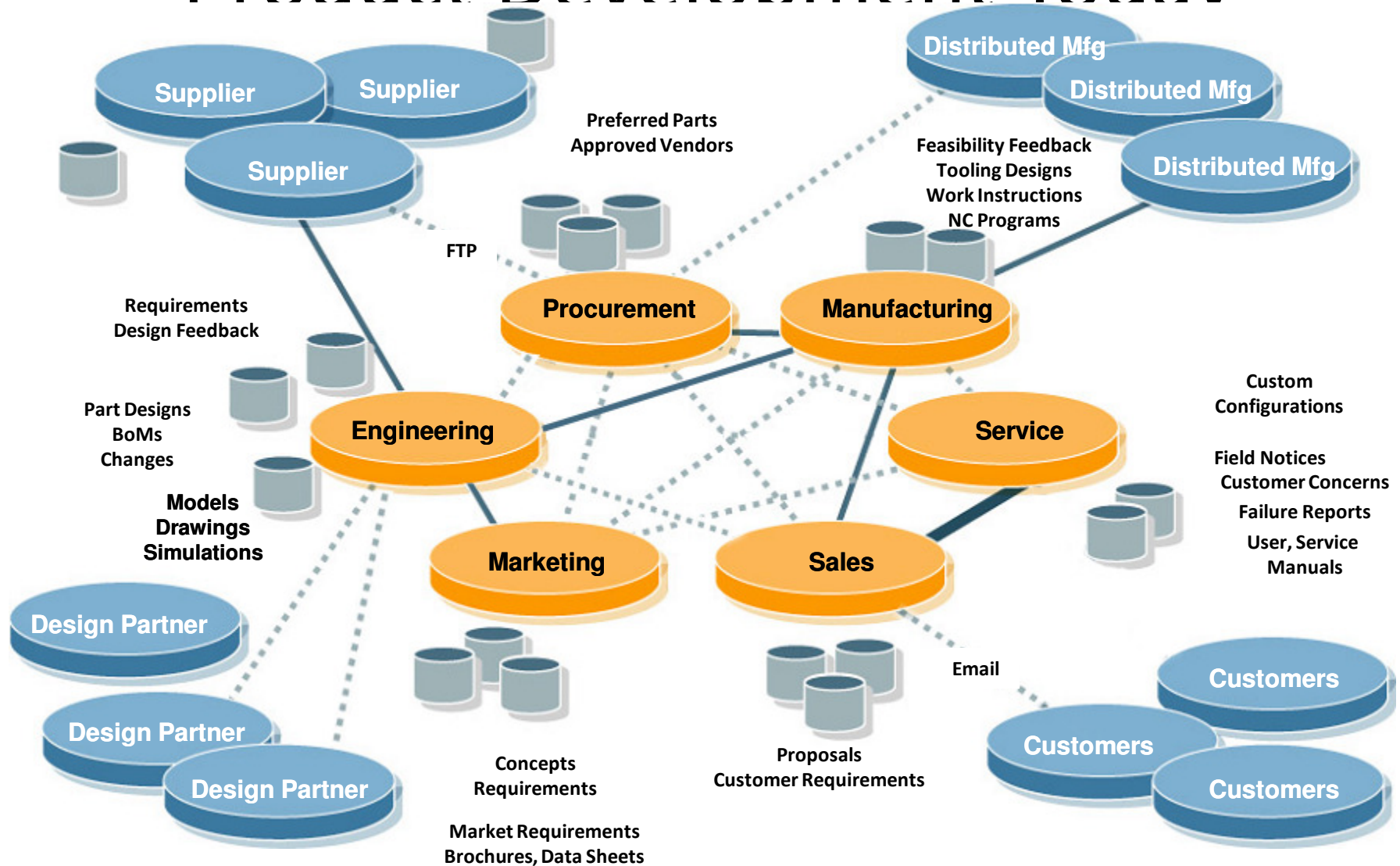
Completely in Sync with PTC Vision

Digital Product Value Chain

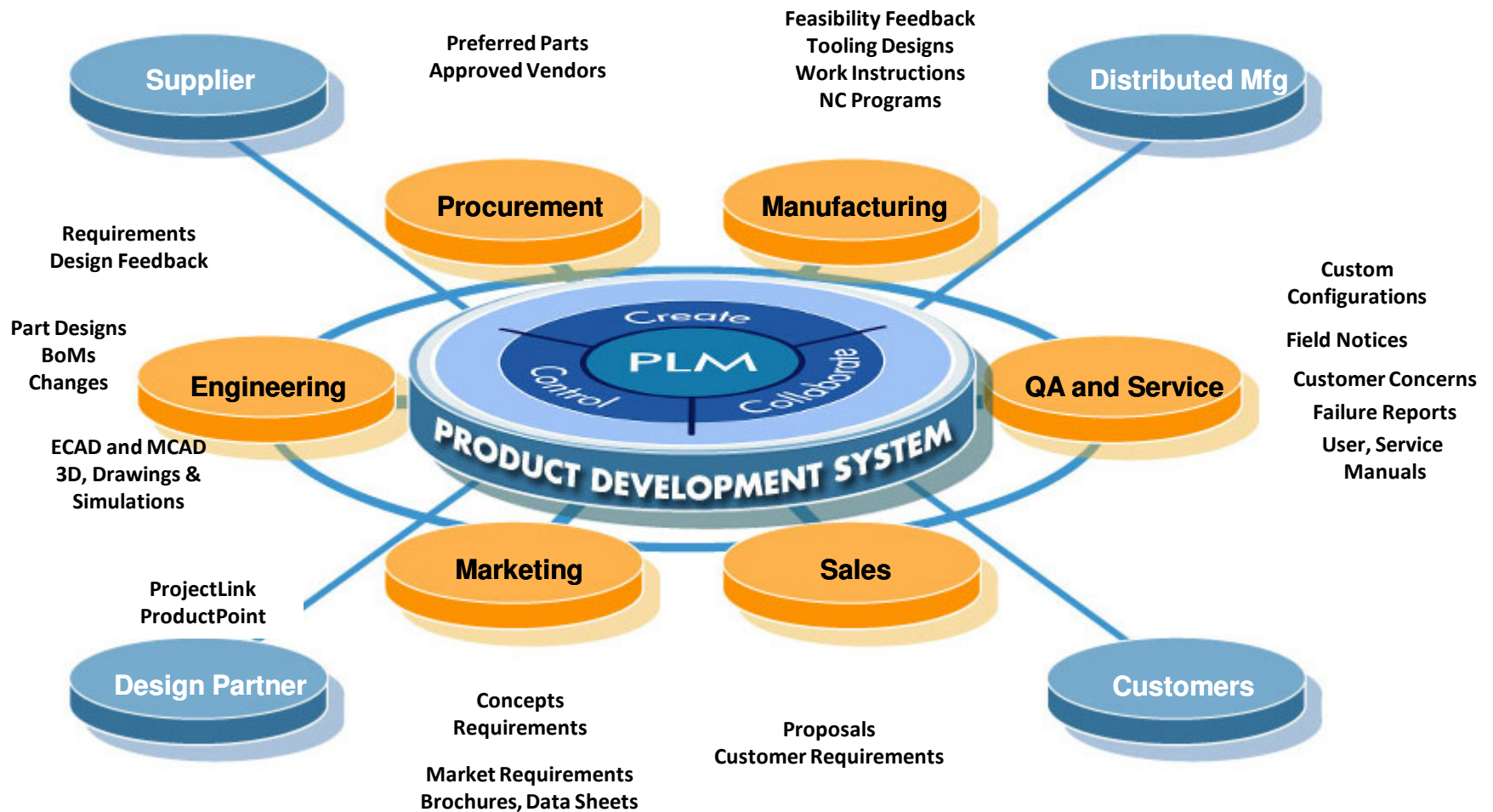
Where the most impactful product decisions are made, features and cost determined, suppliers and materials locked-in.



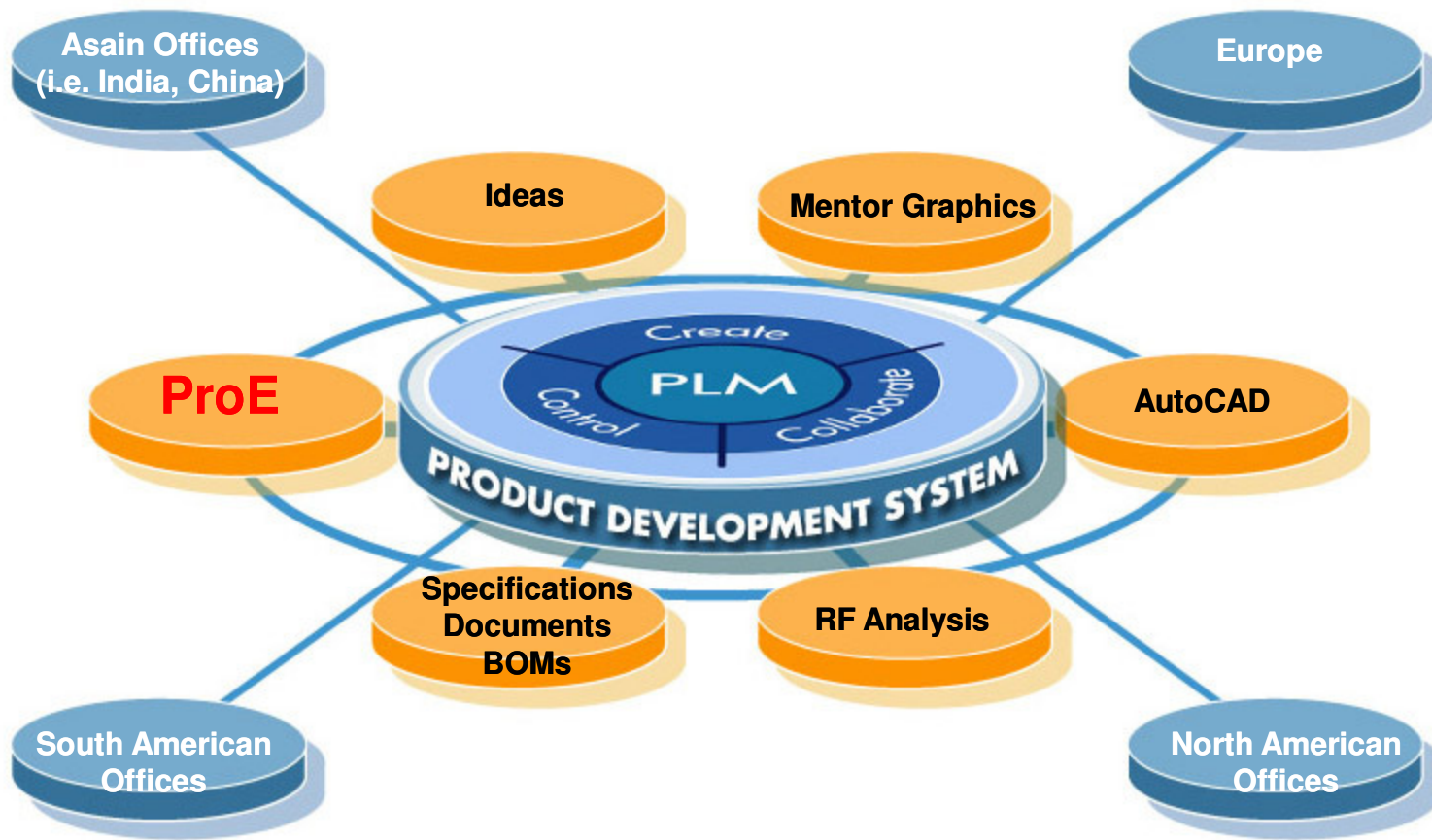
Product Development Today



Optimized Product Development System



Optimized Engineering Application Focused



Standard Global Business Practice

- **In an organization, the number is unique to identify a part.**
- **Types Documents that describe the part can be numbered identical to the part number.**
- **Documents of the same type have a unique number.**

Duplication between Project and PDMLink

- Duplication is due to the fact that ProjectLink and PDMLink started and can be sold as separate systems. The duplication was allowed to make migration of the solutions easier. But it does not follow the business enterprise solution.
- All Com Dev IP Part information is properly numbered and checked into the common PDMLink. There cannot be duplication of Part Numbers.
- ProjectLink is used as a collaboration sharing portal for external ODMs for intellectual property. ODMs can create designs to be approved and checked back into/"SEND TO PDM" the common PDMLink.
- Depending on CAD authoring application and author, CAD files are numbered according to the Part Number
- With various CAD authoring applications of Ideas, ProE and Mentor, the files are numbered according to the Part Number
- There can only be one unique number per CAD/DOC type that corresponds to COMDEV Part.

Step 1 – User Down Time

- Applying this solution must take place on mirrored development, test and then production in that order when users are notified not to use the system.
- Prior to implementing on Production, it is advised to perform rigorous testing on development and test after implementing the solution

Step 2a – Finding Duplicates

- **Duplication between Project and PDMLink allowed for WTParts, WTDocuments and EPMDocuments**
 - **Allowed to create, modify, approve and revise duplicate items in either ProjectLink and PDMLink**

SQL> SELECT WTKEY FROM WTPARTMASTERKEY GROUP BY WTKEY HAVING COUNT(*) > 1;

SQL> SELECT WTKEY FROM WTDOCUMENTMASTERKEY GROUP BY WTKEY HAVING COUNT(*) > 1;

SQL> SELECT WTKEY FROM EPMDOCUMENTMASTERKEY GROUP BY WTKEY HAVING COUNT(*) > 1;

or

SQL> SELECT WTPARTNUMBER FROM WTPARTMASTER GROUP BY WTPARTNUMBER HAVING COUNT(*) > 1;

SQL> SELECT WTDOCUMENTNUMBER FROM WTDOCUMENTMASTER GROUP BY WTDOCUMENTNUMBER HAVING COUNT(*) > 1;

SQL> SELECT DOCUMENTNUMBER FROM EPMDOCUMENTMASTER GROUP BY DOCUMENTNUMBER HAVING COUNT(*) > 1;

Step 2b – Finding Duplicates via Oracle

```
SELECT "EPMDOCUMENTMASTER"."CADNAME" as "CADNAME", "EPMDOCUMENTMASTER"."AUTHORINGAPPLICATION" as "AUTHORINGAPPLICATION",
"EPMDOCUMENTMASTER"."CLASSNAMEKEYCONTAINERREFEREN" as "CLASSNAMEKEYCONTAINERREFEREN",
"EPMDOCUMENTMASTER"."IDA3CONTAINERREFERENCE" as "IDA3CONTAINERREFERENCE", "EPMDOCUMENTMASTER"."DEFAULTUNIT" as "DEFAULTUNIT",
"EPMDOCUMENTMASTER"."DOCSUBTYPE" as "DOCSUBTYPE", "EPMDOCUMENTMASTER"."DOCTYPE" as "DOCTYPE", "EPMDOCUMENTMASTER"."NAME" as "NAME",
"EPMDOCUMENTMASTER"."DOCUMENTNUMBER" as "DOCUMENTNUMBER", "EPMDOCUMENTMASTER"."CLASSNAMEKEYA6" as "CLASSNAMEKEYA6", "EPMDOCUMENTMASTER"."IDA3A6" as
"IDA3A6", "EPMDOCUMENTMASTER"."CLASSNAMEKEYORGANIZATIONREFE" as "CLASSNAMEKEYORGANIZATIONREFE",
"EPMDOCUMENTMASTER"."IDA3ORGANIZATIONREFERENCE" as "IDA3ORGANIZATIONREFERENCE", "EPMDOCUMENTMASTER"."OWNERAPPLICATION" as
"OWNERAPPLICATION", "EPMDOCUMENTMASTER"."SERIES" as "SERIES", "EPMDOCUMENTMASTER"."CREATESTAMPA2" as "CREATESTAMPA2",
"EPMDOCUMENTMASTER"."MARKFORDELETEA2" as "MARKFORDELETEA2", "EPMDOCUMENTMASTER"."MODIFYSTAMPA2" as "MODIFYSTAMPA2",
"EPMDOCUMENTMASTER"."CLASSNAMEA2A2" as "CLASSNAMEA2A2", "EPMDOCUMENTMASTER"."IDA2A2" as
"IDA2A2", "EPMDOCUMENTMASTER"."UPDATECOUNTA2" as "UPDATECOUNTA2", "EPMDOCUMENTMASTER"."UPDATESTAMPA2" as "UPDATESTAMPA2",
"EPMDOCUMENTMASTER"."BRANCHIDA2TYPEDEFINITIONREFE" as "BRANCHIDA2TYPEDEFINITIONREFE", "EPMDOCUMENTMASTER"."IDA2TYPEDEFINITIONREFERENCE" as
"IDA2TYPEDEFINITIONREFERENCE" FROM "EPMDOCUMENTMASTER" WHERE ( "DOCUMENTNUMBER" = 'ENTER NUMBER HERE' )
```

The screenshot shows the 'Table Editor' window for the 'EPMDOCUMENTMASTER' table. The 'Where' tab is active, displaying the SQL query: `SELECT "PDMLINK"."EPMDOCUMENTMASTER"."CADNAME" as "CADNAME", "PDMLINK"."EPMDOCUMENTMASTER"."AUTHORINGAPPLICATION" as "AUTHORINGAPPLICATION",`. Below the query, a table of results is shown with 12 columns: CADNAME, AUTHORING, CLASSNAMEKEYCONTAINERREF, IDA3CONTAINERREFERENCE, DEFAULTUNIT, DOCSUBTYPE, DOCTYPE, NAME, DOCUMENT, CLASSNAME, IDA3A6, and CLASS. Two rows of data are visible, both with 'proe_test_part' in the CADNAME column.

CADNAME	AUTHORING	CLASSNAMEKEYCONTAINERREF	IDA3CONTAINERREFERENCE	DEFAULTUNIT	DOCSUBTYPE	DOCTYPE	NAME	DOCUMENT	CLASSNAME	IDA3A6	CLASS
proe_test_part...	PROE	wt.projmgmt.admin.Project2	48468883	ea		CADCOMPONE	proe_test_brk...	PROE_TEST_P...	wt.epm.occurr...	125235138	wt.org
proe_test_part...	PROE	wt.pdmlink.PDMLinkProduct	70417	ea		CADCOMPONE	proe_test_part	PROE_TEST_P...	wt.epm.occurr...	947854	wt.org

At the bottom of the window, it indicates 'Execute time (s): 0.203' and 'Rows returned: 2'.

Step 3a – Renumbering Duplicates

- A decision is made to renumber the object in either ProjectLink or PDMLink using UI of Windchill
- At site level using Windchill Search, search for the number and select Rename in the Actions link.
- Enter a new number and filename then select OK
 - Most cases, I would renumber and change the filename of the ProjectLink objects to:

Number: 1234567 → 1234567_projectname

Filename: 1234567.prt → 1234567_projectname.prt
- Rerun the SQLs in step 1 to confirm that you did not renumber or change the file name that exist in another project.

Step 3b – Renumbering Duplicates in Oracle

- There are cases where the duplicate is in a Project Workspace. Thus using the search in Windchill will only show one result. In Oracle you can find the duplicate record in the EPMDOCUMENTMASTER table

The screenshot shows the Windchill search interface in a Windows Internet Explorer browser. The search criteria include:

- Name: (empty)
- Organization: (empty)
- Number: 185270-106.ASM
- Filename: (empty)
- Last Modified: -- Select --
- Created On: -- Select --

Buttons: Find..., Save This Search, Clear, Search, Refine search

Search Results (1 of 1 total object) Current View: Default

	Number	Name	Actions	Context	Version	State	Last Modified	Created On
<input type="checkbox"/>	185270-106.ASM	185270-106	Actions	COMM1	0.2	Released	2010-01-20 11:10 EST	2010-01-04 11:22 EST

(0 objects selected)

Step 3b – Finding Duplicates Context in Oracle

- The “EPMDOCUMENTMASTER”.IDA3CONTAINERREFERENCE” is the reference value of PROJECT2.IDA2A2, PDMLINKPRODUCT.IDA2A2 and WTLIBRARY.IDA2A2

Table Editor : "PDMLINK"."EPMDOCUMENTMASTER" - system@WIND_WCORACLE

```
SELECT "PDMLINK"."EPMDOCUMENTMASTER"."CADNAME" as "CADNAME",  
       "PDMLINK"."EPMDOCUMENTMASTER"."AUTHORINGAPPLICATION" as  
       "AUTHORINGAPPLICATION",  
       "PDMLINK"."EPMDOCUMENTMASTER"."CLASSNAMEKEYCONTAINERREFEREN"  
       as "CLASSNAMEKEYCONTAINERREFEREN",  
       "PDMLINK"."EPMDOCUMENTMASTER"."IDA3CONTAINERREFERENCE" as
```

CADNAME	AUTHORIN...	CLASSNAMEKEYCONTAINERREFEREN	IDA3CONTAINERREFERENCE	DEFAULTU
proe_test_part-2.prt	PROE	wt.projmgmt.admin.Project2	48466883	ea
proe_test_part-2.prt	PROE	wt.pdmlink.PDMLinkProduct	70417	ea

Execute time (s): 0.188 Rows returned: 2 Apply Revert Hide SQL Close Help

Step 3c – Finding the Duplicates Context in Oracle

- In this case, a search was performed in Project2 table:

```
SELECT "PROJECT2"."CLASSNAMEKEYA2CONTAINERINFO" as "CLASSNAMEKEYA2CONTAINERINFO", "PROJECT2"."IDA3A2CONTAINERINFO" as "IDA3A2CONTAINERINFO",
"PROJECT2"."NAMECONTAINERINFO" as "NAMECONTAINERINFO", "PROJECT2"."CLASSNAMEKEYCONTAINERREFEREN" as "CLASSNAMEKEYCONTAINERREFEREN",
"PROJECT2"."IDA3CONTAINERREFERENCE" as "IDA3CONTAINERREFERENCE", "PROJECT2"."CLASSNAMEKEYORGANIZATIONREFE" as "CLASSNAMEKEYORGANIZATIONREFE",
"PROJECT2"."IDA3ORGANIZATIONREFERENCE" as "IDA3ORGANIZATIONREFERENCE", "PROJECT2"."PROJECTNUMBER" as "PROJECTNUMBER", "PROJECT2"."CLASSNAMEKEYA7" as
"CLASSNAMEKEYA7", "PROJECT2"."IDA3A7" as "IDA3A7", "PROJECT2"."CLASSNAMEA2A2" as "CLASSNAMEA2A2", "PROJECT2"."IDA2A2" as "IDA2A2" FROM "PROJECT2" WHERE (
"IDA2A2" = '48466883' )
```

Table Editor : "PDMLINK"."PROJECT2" - system@WIND_WCORACLE

Select From Where

IDA2A2 = 48466883

NEW AND OR NOT DELETE

"PDMLINK"."PROJECT2"."CLASSNAMEKEYA7" as "CLASSNAMEKEYA7",
"PDMLINK"."PROJECT2"."IDA3A7" as "IDA3A7",
"PDMLINK"."PROJECT2"."CLASSNAMEA2A2" as "CLASSNAMEA2A2",
"PDMLINK"."PROJECT2"."IDA2A2" as "IDA2A2"
FROM "PDMLINK"."PROJECT2"
WHERE ("IDA2A2" = '48466883')

CLASSNAM...	IDA3A2CON...	NAMECONT...	CLASSNAM...	IDA3CONTA...	CLASSNAM...	IDA3ORGA...	PROJECTN...	CLASSNAM...	IDA3A7
wt.org.WTGroup	48466886	India Project	wt.inf.container...	5190	wt.org.WTOrga...	837	000023	wt.org.WTUser	7977

Execute time (s): 0.016 Rows returned: 1

Apply Revert Hide SQL Close Help

Step 3d – Renumbering Both EPMDOCUMENTMASTER AND EPMDOCUMENTMASTERKEY Duplicates in Oracle

- the objects EPMDOCUMENTMASTERKEY.WTKEY, EPMDOCUMENTMASTER.CADNAME and EPMDOCUMENTMASTER.DOCUMENTNUMBER were reset to *_india*:

```
SELECT WTKEY FROM EPMDOCUMENTMASTERKEY GROUP BY WTKEY HAVING COUNT(*) > 1;
```

```
SELECT "PDMLINK"."EPMDOCUMENTMASTERKEY"."WTKEY" as "WTKEY",
"PDMLINK"."EPMDOCUMENTMASTERKEY"."CLASSNAMEKEYA4" as "CLASSNAMEKEYA4",
"PDMLINK"."EPMDOCUMENTMASTERKEY"."IDA3A4" as "IDA3A4"
from "PDMLINK"."EPMDOCUMENTMASTERKEY" where ("WTKEY"='185439-GSE.ASM');
```

```
SELECT "PDMLINK"."EPMDOCUMENTMASTER"."IDA2A2" as "IDA2A2",
"PDMLINK"."EPMDOCUMENTMASTER"."CADNAME" as "CADNAME",
"PDMLINK"."EPMDOCUMENTMASTER"."DOCUMENTNUMBER" as "DOCUMENTNUMBER",
"PDMLINK"."EPMDOCUMENTMASTER"."CLASSNAMEKEYCONTAINERREFEREN" as "CLASSNAMEKEYCONTAINERREFEREN",
"PDMLINK"."EPMDOCUMENTMASTER"."IDA3CONTAINERREFERENCE" as "IDA3CONTAINERREFERENCE",
"PDMLINK"."EPMDOCUMENTMASTER"."AUTHORINGAPPLICATION" as "AUTHORINGAPPLICATION"
from "PDMLINK"."EPMDOCUMENTMASTER" where ("IDA2A2"='124636760');
```

Table Editor : "PDMLINK"."EPMDOCUMENTMASTER" - system@WIND_WCORACLE

```
UPDATE "PDMLINK"."EPMDOCUMENTMASTER"
SET "CADNAME" = 'proe_test_part-2_india.prt',
"DOCUMENTNUMBER" = 'PROE_TEST_PART-2_INDIA.PRT'
WHERE rowid = 'AAAnMPAAIAAr9TAAJ'
```

CADNAME	AUTHORIN...	CLASSNAMEKEYCONTAINER...	IDA3CONTA...	DOCSUBTY...	DOCTYPE	NAME	DOCUMENTNUMBER	CLASSNAM...
proe_test_part-2_india.prt	PROE	wt.projmgmt.admin.Project2	48466883		CADCOMPONE...	proe_test_brkt...	PROE_TEST_PART-2_INDIA.PRT	wt.org.WTOrga...
proe_test_part-2.prt	PROE	wt.pdmlink.PDMLinkProduct	70417		CADCOMPONE...	proe_test_part...	PROE_TEST_PART-2.PRT	wt.org.WTOrga...

Execute time (s): 0.0 Rows returned: 2

Apply Revert Hide SQL Close Help

Step 4 – Adding More Doctypes to Synchronize with File Extensions

- **Depending on your CAD tool, you may need to add more doctypes**

Step 5 – Current Oracle Unique Indexes in Windchill

- **Currently uniqueness is based on**

- **For WTPART**

WTPARTMASTERKEY\$UNIQUE ON WTPARTMASTERKEY Table

WTKEY, IDA3ORAGANIZATIONREFERENCE, IDA3NAMESPACEREFERENCE

- **For WTDOCUMENT**

WTDOCUMENTMASTERKEY\$UNIQUE ON WTDOCUMENTMASTERKEY Table

WTKEY, IDA3ORAGANIZATIONREFERENCE, IDA3NAMESPACEREFERENCE

- **For EPMDOCUMENT**

EPMDOCUMENTMASTERKEY\$UNIQUE ON EPMDOCUMENTMASTERKEY Table

WTKEY, IDA3ORAGANIZATIONREFERENCE, IDA3NAMESPACEREFERENCE

Step 5 – New Oracle Unique Indexes to Enforce Uniqueness in PLM

- In SQLPLUS logged in as the Windchill oracle user, run the following command to drop and recreate the new unique indexes*

```
SQL> drop index WTPartMasterKey$UNIQUE;  
SQL> drop index WTDocumentMasterKey$UNIQUE;  
SQL> drop index EPMDocumentMasterKey$UNIQUE;
```

```
SQL> CREATE UNIQUE INDEX WTPartMasterKey$UNIQUE ON WTPartMasterKey(wtkey,idA3organizationReference) TABLESPACE INDX  
STORAGE ( INITIAL 20k NEXT 20k PCTINCREASE 0 );
```

```
SQL> CREATE UNIQUE INDEX WTDocumentMasterKey$UNIQUE ON WTDocumentMasterKey(wtkey,idA3organizationReference)  
TABLESPACE INDX STORAGE ( INITIAL 20k NEXT 20k PCTINCREASE 0 );
```

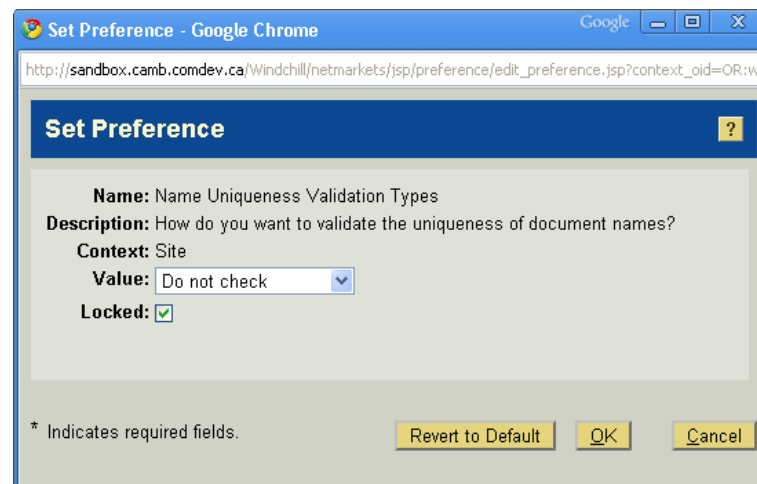
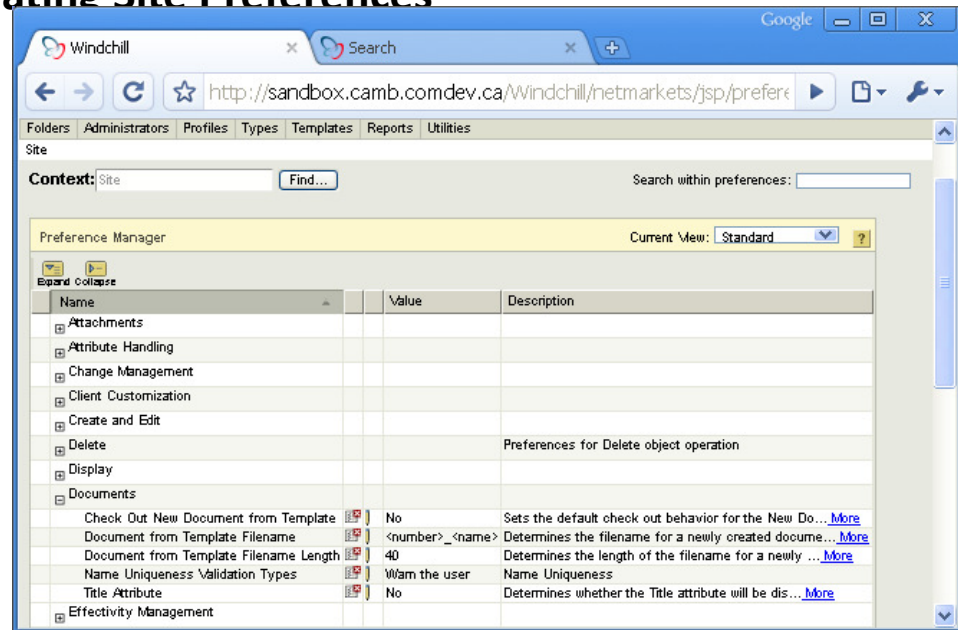
```
Or SQL> CREATE UNIQUE INDEX WTDocumentMaster$UNIQUE ON  
WTDocumentMaster(WTdocumentnumber,doctype,idA3organizationReference) TABLESPACE INDX STORAGE ( INITIAL 20k NEXT  
20k PCTINCREASE 0 );
```

```
SQL> CREATE UNIQUE INDEX EPMDocumentMaster$UNIQUE ON  
EPMDocumentMaster(documentnumber,doctype,authoringapplication,idA3organizationReference) TABLESPACE INDX STORAGE ( INITIAL 20k NEXT 20k PCTINCREASE 0 );
```

```
SQL> CREATE UNIQUE INDEX EPMDocumentMasterFile$UNIQUE ON  
EPMDocumentMaster(cadname,authoringapplication,idA3organizationReference) TABLESPACE INDX STORAGE ( INITIAL 20k NEXT 20k PCTINCREASE 0 );
```

- Documents

Step 6 – Updating Site Preferences



Step 6 – Updating Site Preferences - Windchill Workgroup Manager

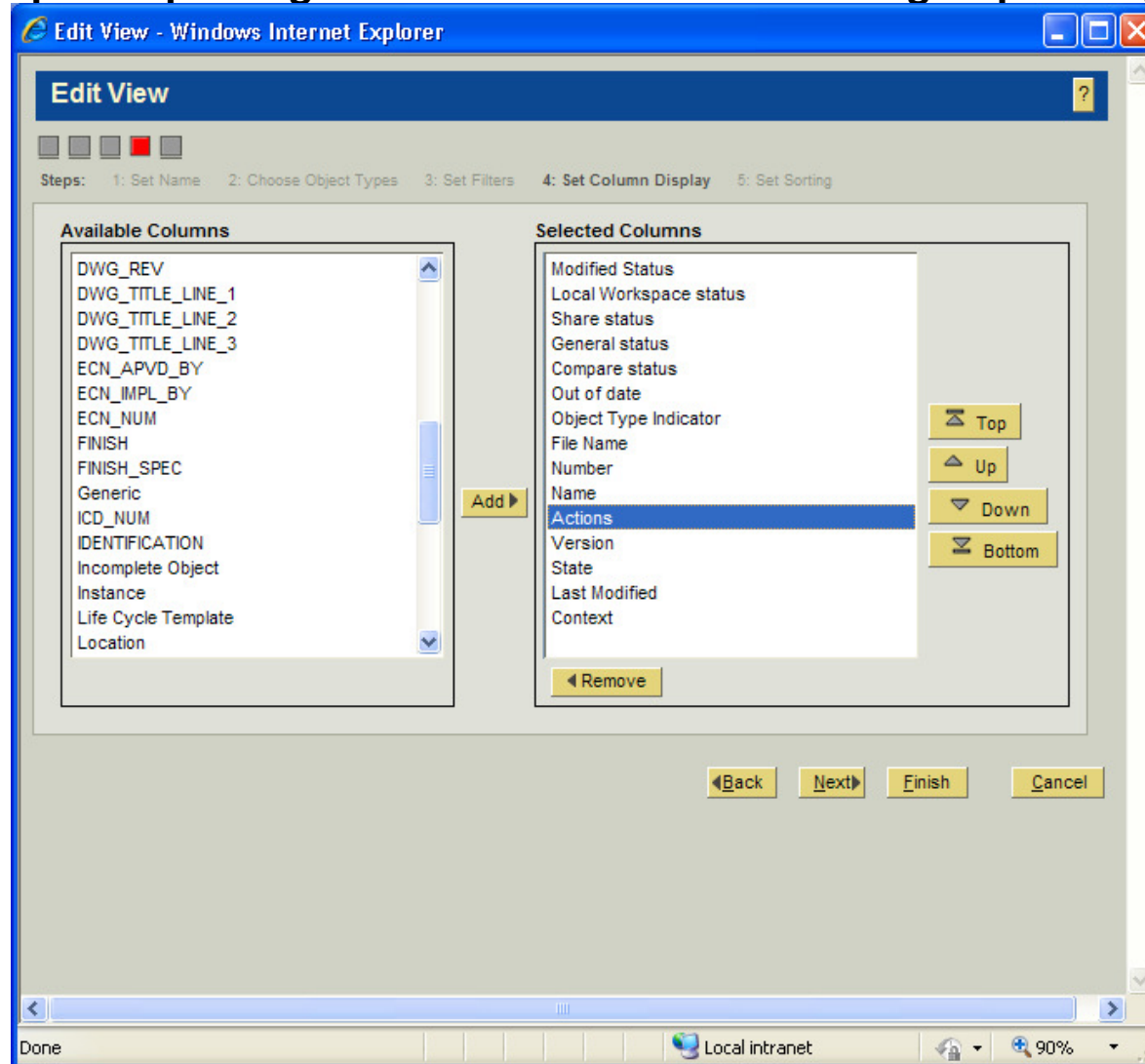
The first screenshot shows the Windchill Workgroup Manager interface. The left sidebar lists various categories: Visualization, Windchill Workgroup Manager, Client, and Server. The main area displays a list of preferences with columns for Name, Description, and a 'More' link. The 'Client' category is expanded, showing preferences like 'Upload Drop Name File Extension', 'Upload Drop Number File Extension', 'Upload After Native Save', 'Upload CAD Document and Attachment Filter', and 'Use Explicit Mapping for Designated Parameter Creation'. The 'Server' category is also expanded, showing 'Is Model Name Unique', 'Synchronize CAD Model Name with CAD Doc Number', 'Preferences for Cad Doc Property Page', 'Remove from Workspace', and 'Rename'.

The second screenshot shows the 'Set Preference' dialog box for the 'Upload Drop Name File Extension' preference. The dialog includes fields for Name, Description, Client (Windchill), Context (Site), Value (Undefined, Yes, No), and Locked (checked). Buttons for 'Revert to Default', 'OK', and 'Cancel' are at the bottom.

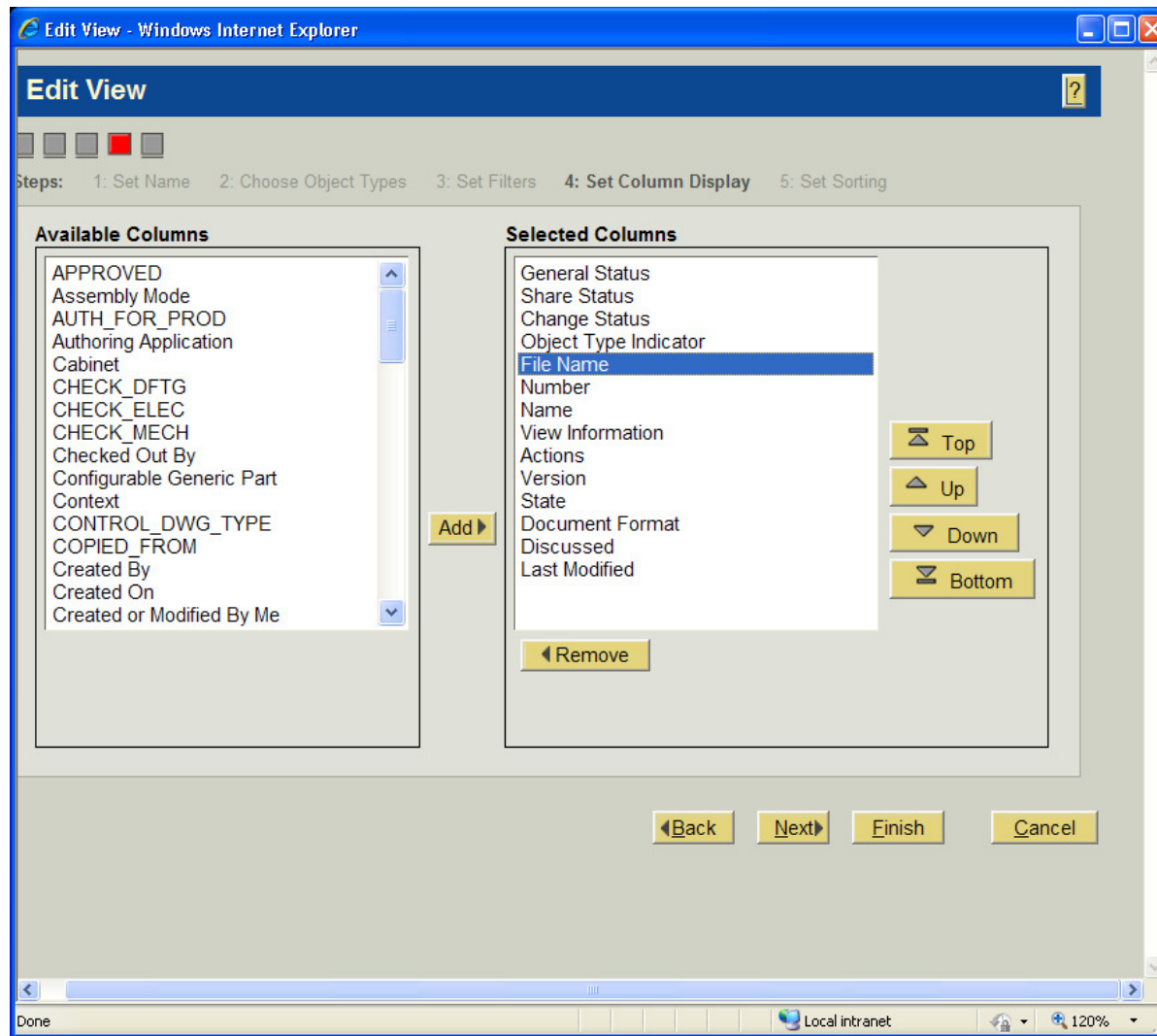
The third screenshot shows the 'Set Preference' dialog box for the 'Is Model Name Unique' preference. The dialog includes fields for Name, Description, Context (Site), Value (Undefined, Yes, No), and Locked (checked). Buttons for 'Revert to Default', 'OK', and 'Cancel' are at the bottom.

The fourth screenshot shows the 'Set Preference' dialog box for the 'Synchronize CAD Model Name with CAD Doc Number' preference. The dialog includes fields for Name, Description, Context (Site), Value (Undefined, Yes, No), and Locked (checked). Buttons for 'Revert to Default', 'OK', and 'Cancel' are at the bottom.

Step 7 – Updating Table Views in Windchill Workgroup Manager



Step 7 – Updating Table Folder Views in Contexts (Products, Projects & Libraries)



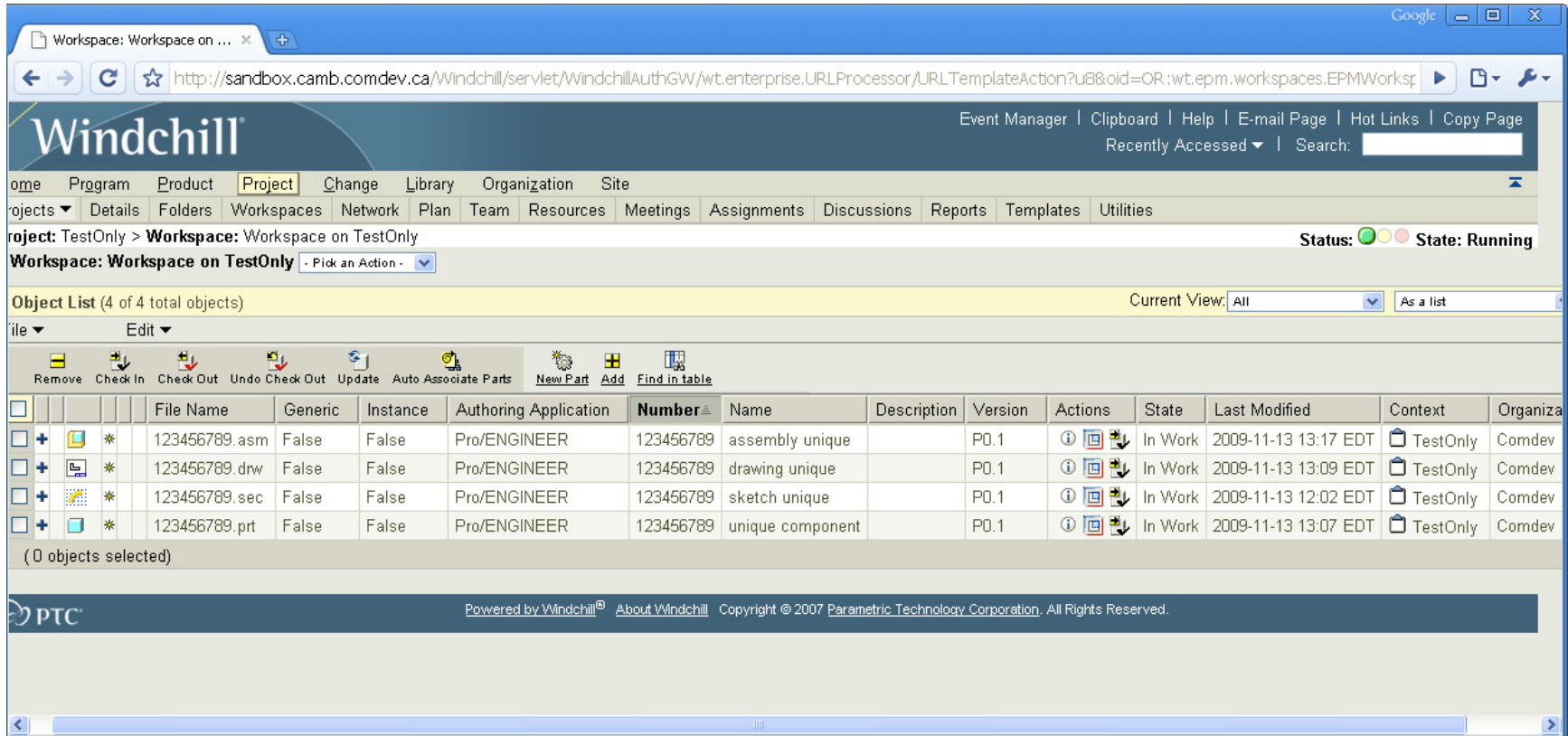
Step 8 – Additional Steps. Must do if this solution is applied prior to Upgrade

- In Pro/E WGM, it performs file name uniqueness in a API which is not necessary and redundant because it is already performed at the database level. This must be removed or disabled via PTC support or customization.
- ***During upgrades, prior to Adding Constraints stage in the upgrade, the \$WT_HOME/Upgrade/Upgrade/UpgradePhases/AddConstraints/UniqueWork.sql must be modified to accommodate the new unique indexes.**
- CREATE UNIQUE INDEX EPMDOCUMENTMASTERKEY\$UNIQ0 ON EPMDocumentMasterKey(wtkey,idA3organizationReference,idA3namespaceReference) TABLESPACE INDX STORAGE (INITIAL 20k NEXT 20k PCTINCREASE 0)
- CREATE UNIQUE INDEX WTDDOCUMENTMASTERKEY\$UNIQ0 ON WTDDocumentMasterKey(wtkey,idA3organizationReference,idA3namespaceReference) TABLESPACE INDX STORAGE (INITIAL 20k NEXT 20k PCTINCREASE 0)
- CREATE UNIQUE INDEX WTPARTMASTERKEY\$UNIQ0 ON WTPartMasterKey(wtkey,idA3organizationReference,idA3namespaceReference) TABLESPACE INDX STORAGE (INITIAL 1m NEXT 1m PCTINCREASE 0)
- **Changed to:**
- CREATE UNIQUE INDEX **EPMDocumentMaster\$UNIQUE** ON EPMDocumentMaster(documentnumber,doctype,authoringapplication,idA3organizationReference) TABLESPACE INDX STORAGE (INITIAL 20k NEXT 20k PCTINCREASE 0);
- /
- CREATE UNIQUE INDEX **EPMDocumentMasterFile\$UNIQUE** ON EPMDocumentMaster(cadname,authoringapplication,idA3organizationReference) TABLESPACE INDX STORAGE (INITIAL 20k NEXT 20k PCTINCREASE 0);
- CREATE UNIQUE INDEX WTDDocumentMasterKey\$UNIQUE ON WTDDocumentMasterKey(wtkey,idA3organizationReference) TABLESPACE INDX STORAGE (INITIAL 20k NEXT 20k PCTINCREASE 0);
- CREATE UNIQUE INDEX WTPartMasterKey\$UNIQUE ON WTPartMasterKey(wtkey,idA3organizationReference) TABLESPACE INDX STORAGE (INITIAL 20k NEXT 20k PCTINCREASE 0);

Result of this Solution

- **WTPart**
 - Only 1 unique WTPart can exist per organization
- **WTDocument**
 - Only 1 unique WTDocument can exist per organization
- **EPMDocuments**
 - Are uniquely managed according to number, type, authoring application and organization
 - EPM file names are also uniquely managed according to filenames, authoring application and organization (**i.e. Pro/INTRALINK behavior**)
- **Thus:**
 - Auto Association of CAD to Part will be based on synchronizing CAD and WTPart number only. If there is no respective Part number, there will not be an auto creation of Parts
 - Number generation is manual for WTDocuments and EPMDocuments if there is a requirement to synchronize WTPart number

Result of this Solution – Workspace View



The screenshot displays the Windchill workspace interface. At the top, the browser address bar shows the URL: `http://sandbox.camb.comdev.ca/Windchill/servlet/WindchillAuthGW/wt.enterprise.URLProcessor/URLTemplateAction?u8&oid=OR:wt.epm.workspaces.EPMWorksp`. The Windchill logo is on the left, and navigation links like "Event Manager", "Clipboard", "Help", "E-mail Page", "Hot Links", and "Copy Page" are on the right. Below the logo, a menu bar includes "ome", "Program", "Product", "Project", "Change", "Library", "Organization", and "Site". A secondary menu bar lists various project-related functions: "Projects", "Details", "Folders", "Workspaces", "Network", "Plan", "Team", "Resources", "Meetings", "Assignments", "Discussions", "Reports", "Templates", and "Utilities".

The main content area shows the "Workspace: Workspace on TestOnly" view. It includes a status bar with "Status: [green circle] [yellow circle] [red circle] State: Running" and a "Workspace: Workspace on TestOnly" dropdown menu. Below this is an "Object List (4 of 4 total objects)" section. The "Current View" is set to "All", and the view is displayed "As a list".

The object list table contains the following data:

File	File Name	Generic	Instance	Authoring Application	Number	Name	Description	Version	Actions	State	Last Modified	Context	Organiza
<input type="checkbox"/>	123456789.asm	False	False	Pro/ENGINEER	123456789	assembly unique		P0.1		In Work	2009-11-13 13:17 EDT	TestOnly	Comdev
<input type="checkbox"/>	123456789.drw	False	False	Pro/ENGINEER	123456789	drawing unique		P0.1		In Work	2009-11-13 13:09 EDT	TestOnly	Comdev
<input type="checkbox"/>	123456789.sec	False	False	Pro/ENGINEER	123456789	sketch unique		P0.1		In Work	2009-11-13 12:02 EDT	TestOnly	Comdev
<input type="checkbox"/>	123456789.prt	False	False	Pro/ENGINEER	123456789	unique component		P0.1		In Work	2009-11-13 13:07 EDT	TestOnly	Comdev

Below the table, it indicates "(0 objects selected)". At the bottom of the interface, the PTC logo is visible, along with the text: "Powered by Windchill® About Windchill Copyright © 2007 Parametric Technology Corporation. All Rights Reserved."

Result of this Solution – Context Folder View

The screenshot shows a web application interface for a 'Context Folder View'. The browser window is titled 'Folder: General - Windows Internet Explorer'. The address bar shows a URL from 'http://sandbox.camb.comdev.ca/Windchill/'. The page has a navigation bar with tabs: Home, Program, Product, Project, Change, Library, Organization, Site. Below this is a sub-navigation bar with tabs: Projects, Details, Folders, Workspaces, Network, Plan, Team, Resources, Meetings, Assignments, Discussions, Reports, Templates, Utilities. The main content area shows 'Project: TestOnly > Folder: General' with a status indicator (green, yellow, red circles) and 'State: Running'. A search bar is present with the text 'Search within folder:'. On the left, a 'Folders' sidebar shows 'TestOnly' and 'General'. The main area is titled 'Folder Contents (5 of 5 total objects)' and shows a table of objects. The table has columns: Actions, Number, Name, Version, State, File Name, Authoring Application, Modified By, Last Modified, and Organization ID. The objects are: 'assembly unique', 'drawing unique', 'sketch unique', 'unique component', and 'Unique WTPart'. The status bar at the bottom shows '(0 objects selected)'.

Folder: General

Project: TestOnly > Folder: General

Status: ● ● ● State: Running

Search within folder:

Actions ▼ **General**

Location: / [TestOnly](#) / General Domain: /Default

Folders

- TestOnly
- General

Folder Contents (5 of 5 total objects) Current View: Last Modified

File ▼ Edit ▼

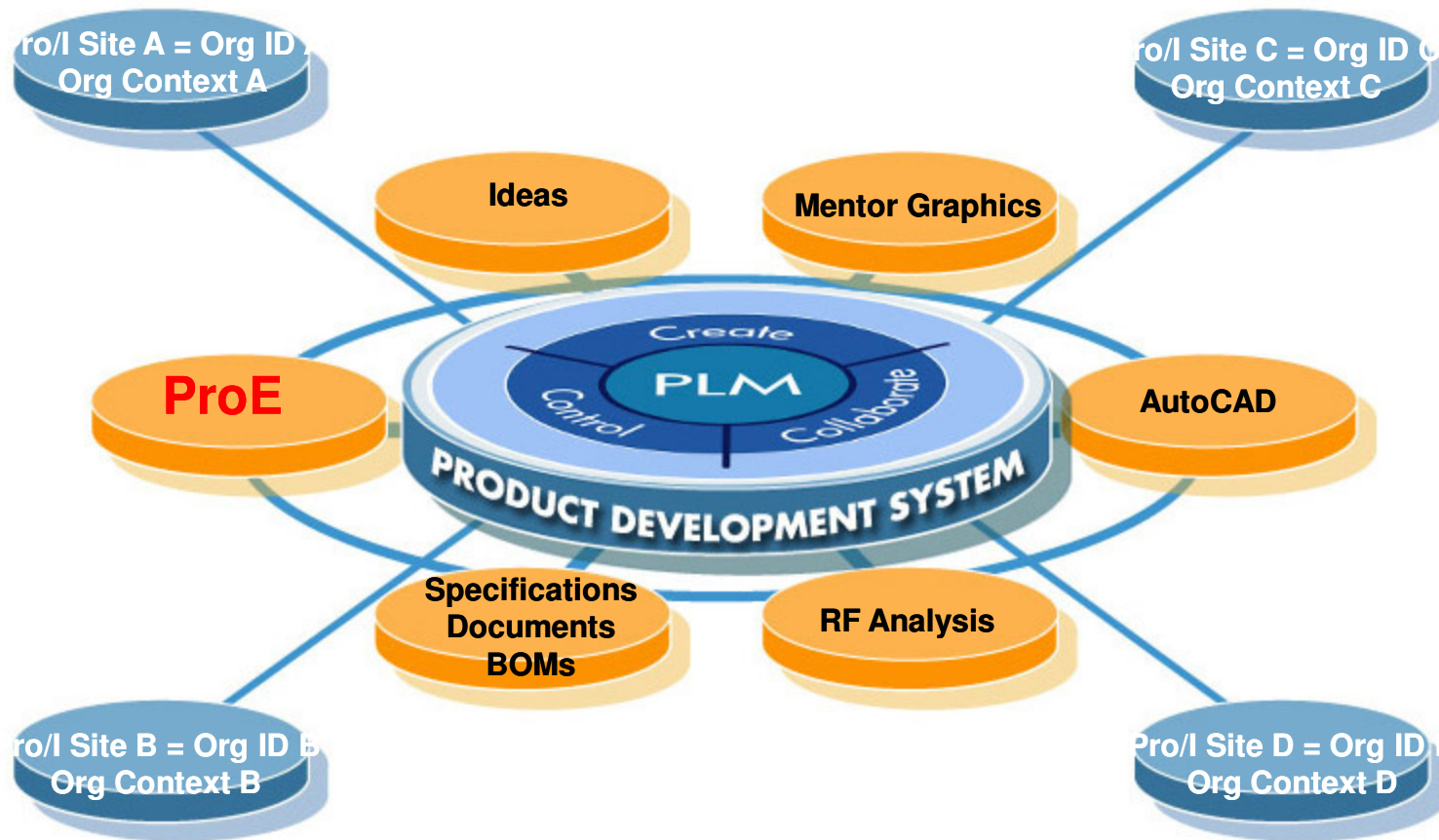
Cut Copy Paste Delete Check out to workspace Add to Workspace New Folder New Document New Multiple Documents New Document from Template New Part New Multiple Parts New Link Update Project

	Actions	Number	Name	Version	State	File Name	Authoring Application	Modified By	Last Modified	Organization ID
<input type="checkbox"/>	ⓘ Actions ▼	123456789	assembly unique	P0.1	In Work	123456789.asm	Pro/ENGINEER	Patrick Chin	2009-11-13 14:56 EST	Comdev
<input type="checkbox"/>	ⓘ Actions ▼	123456789	drawing unique	P0.1	In Work	123456789.drw	Pro/ENGINEER	Patrick Chin	2009-11-13 14:56 EST	Comdev
<input type="checkbox"/>	ⓘ Actions ▼	123456789	sketch unique	P0.1	In Work	123456789.sec	Pro/ENGINEER	Patrick Chin	2009-11-13 14:56 EST	Comdev
<input type="checkbox"/>	ⓘ Actions ▼	123456789	unique component	P0.1	In Work	123456789.prt	Pro/ENGINEER	Patrick Chin	2009-11-13 14:56 EST	Comdev
<input type="checkbox"/>	ⓘ Actions ▼	123456789	Unique WTPart	A.1 (Design)	In Work			Patrick Chin	2009-11-13 14:56 EST	Comdev

(0 objects selected)

Internet 100%

Pro/INTRALINK Migrations



Appendix A – OOTB EPM Management in PLM

All Pro/E separate CAD types, such as assemblies, parts, drawings, sections, layouts, etc, are managed in one unique EPM CAD document object. Most common practice have the same number for various types. Due to PTC Pro/I practices and methodology, the uniqueness was the file name with extension. Pro/I was a file management tool.

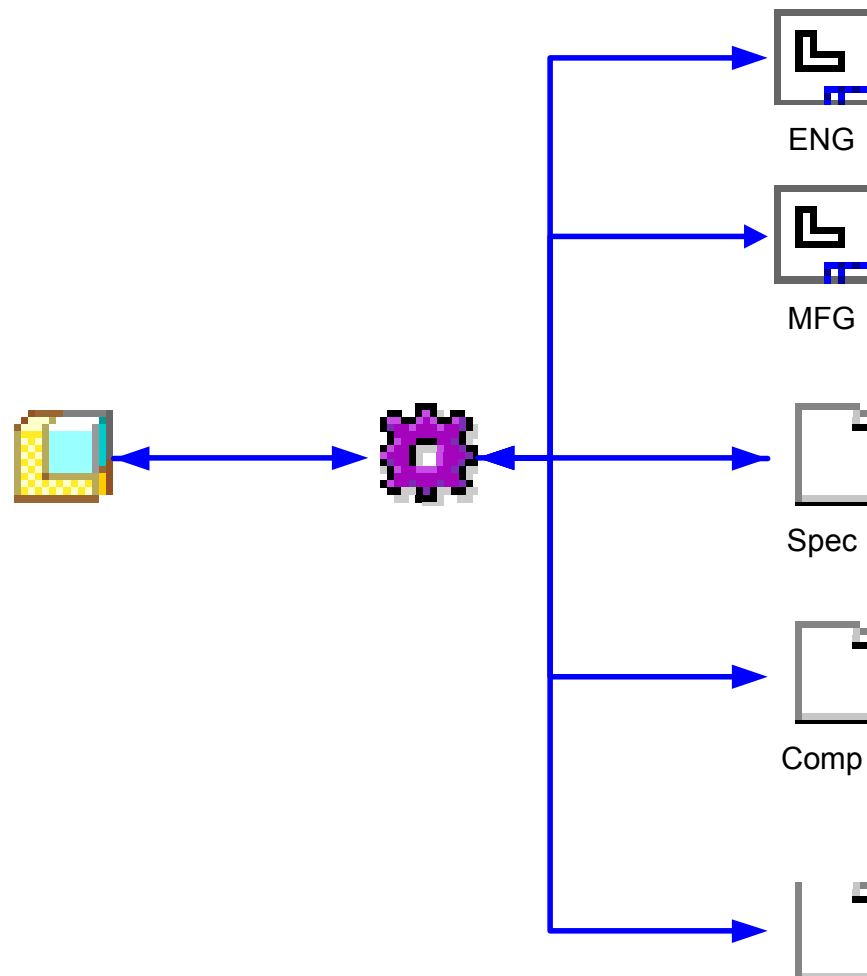
Pro/E SECTION	EPM DOCUMENT
Pro/E PART	
Pro/E ASSEMBLY	
Pro/E MANUFACTURING	
Pro/E DRAWING	
Pro/E LAYOUT	
Pro/E MARKUP	
Pro/E DIAGRAM	
Pro/E Other file types	

Appendix A – OOTB EPM Management in PLM

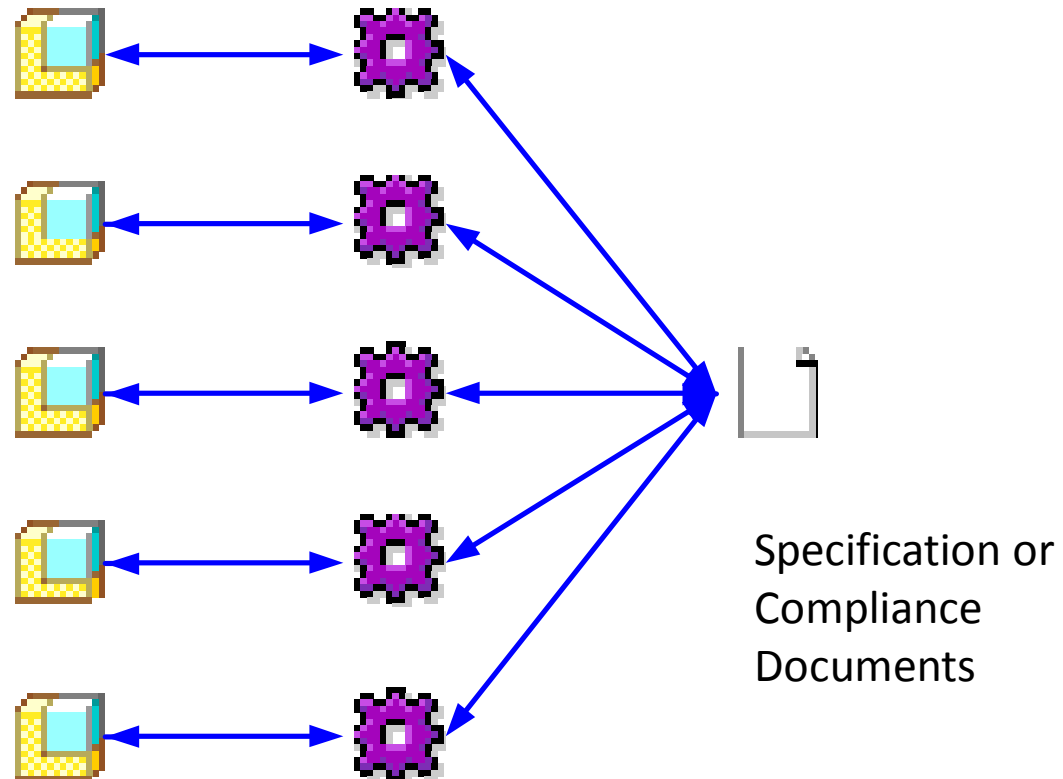
Furthermore, Windchill allows multiple CAD and Arbortext but they all still are managed by a single EPM document type. Most companies use the same number if copied from one CAD tool to another for collaboration and sharing of IP. Thus, conflicts will occur if the CAD tools use the same number and file name with extension. As a result, OOTB does not following standard practices of both business and CAD tools.

Multiple Pro/E file types	EPM DOCUMENT
Multiple ACAD types	
Multiple CATIA types	
Multiple CATIAV5 types	
Multiple SOLIDWORKS types	
Multiple UG types	
Multiple Ideas types	
Multiple ARBORTEXT content types	
Multiple CADENCE CAD types	
Multiple CCD CAD types	
Multiple INVENTOR CAD types	
Multiple ME10 CAD types	
Multiple HELIX CAD types	
Multiple ORCAD CAD types	
Multiple MENTORB, D and E CAD types	
Multiple CADD5 types	
Multiple CADSTAR types	
Multiple VISULA CAD types	
Other CAD types	

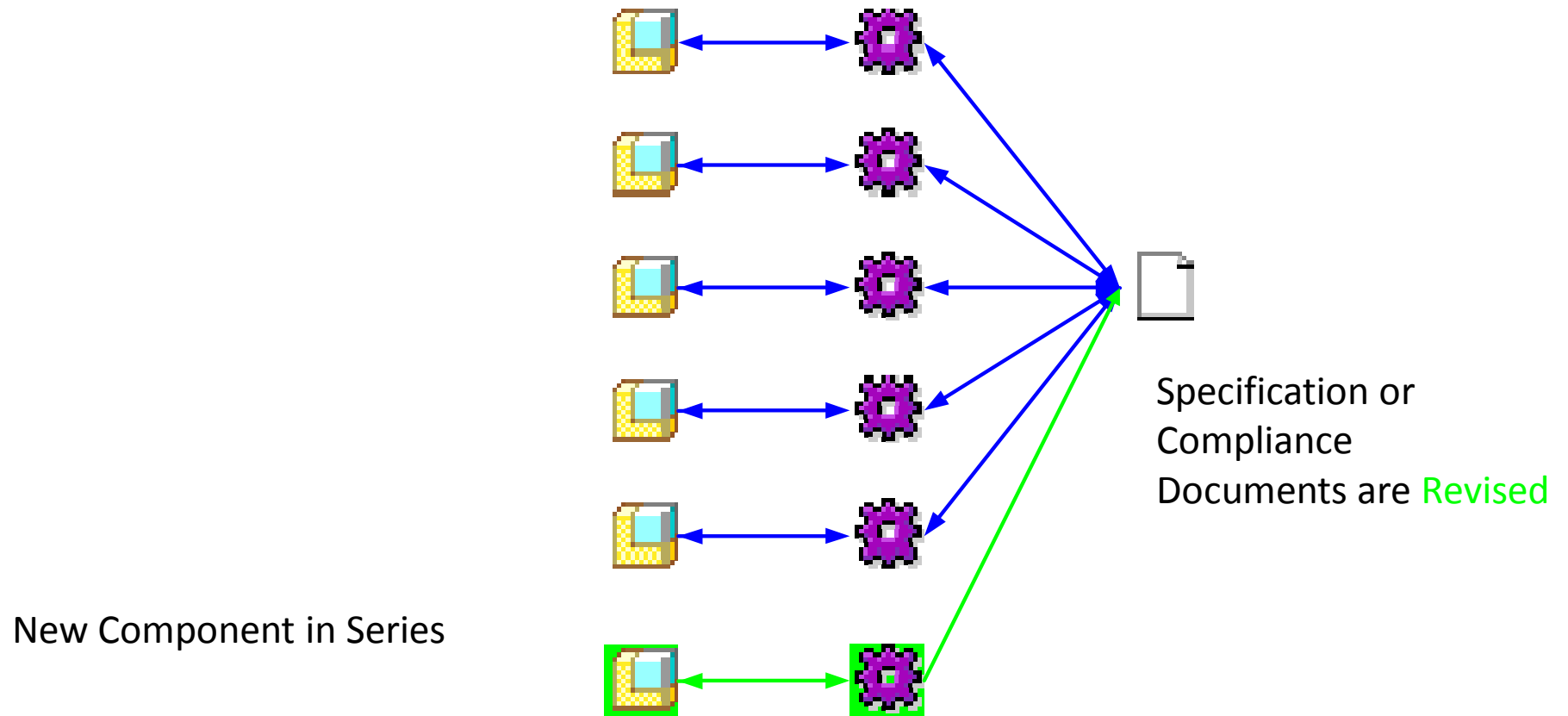
Relationship between Reference Documents and Components



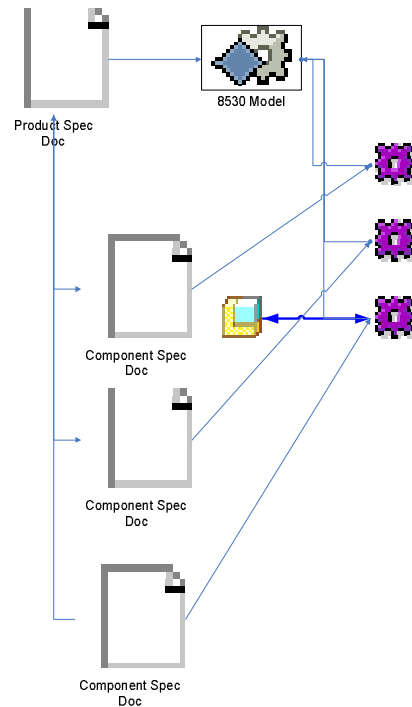
Relationship between Reference Documents and Components



Relationship between Reference Documents and Components

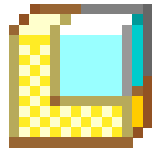


Product Spec and Component Spec



“As Process” CAD Methodology

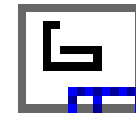
PDF



CAD Model

Name: 1234568-001.asm

File Name: 1234568-001.asm



Drawing (Optional)

Number: **1234568-001**

Version: **A.1**

Baan #: **1234568-001**

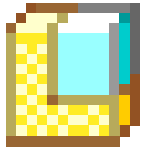
Name: Housing

Attributes

- Description
- Nylon
- Black
- Smooth Textured

New Methodology Compliance

Fit or Form Change after Release

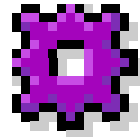


CAD Model

Number: **1234568**

Name: Housing

File Name: 1234568.asm



Part Representation

Number: **1234568**

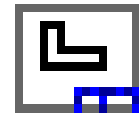
Version: **1.1**

Baan #: **1234568-001**

Name: Housing

Attributes

- Description
- Teflon (temperatures)
- Black
- Smooth Textured



Drawing (Optional)

Number: **1234568-001**

Version: **A.1**

Baan #: **1234568-001**

Name: Housing

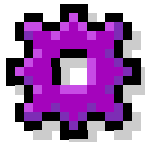
Attributes

- Description
- Nylon
- Black
- Smooth Textured

PLM CAD Methodology

To be proposed to the Design Automation and executive teams of standardizing engineering and manufacturing for part, ProE CAD model and drawing methodology based on best industry practices.

Standardized **Component** Part, CAD Model and Drawing Nomenclature Methodology



Part Representation

Number: #####

Version: -.I (- no revision)

Name: 60 characters

Physical Attributes Only

- Material
- Finish
- Colour
- Dimensions



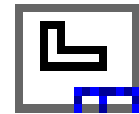
Component CAD Model

Number: #####

Version: A.I (A is Alfa)

Name: 60 characters

File Name: #####.prt
(number + ext)



Component CAD Drawing (Optional)

Number: #####

Version: A.I (A is Alfa)

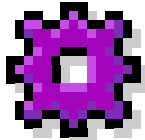
Name: 60 characters

File Name: #####.drw
(number + ext)

Attributes:

- Material
- Finish
- Colour
- RoHS

Standardized **Assembly** Part, CAD and Drawing Nomenclature Methodology



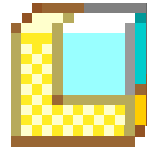
Assembly Part Representation

Number: #####

Version: **A.3** (Alpha revision
sequence for assemblies)

Name: ASSY HOUSING

BOMs:



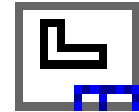
CAD Assembly Model

Number: #####

Version: A.1

Name: ASSY HOUSING

File Name: #####.asm



CAD Drawing

Number: #####

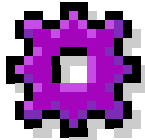
Version: A.1

Name: ASSY HOUSING

File Name: #####.drw

Example of a Standardized **Component** Part, CAD Model and Drawing

Initial Release



Part Representation

Number: **184786**

Version: -.I (- no revision)

Name: COMPONENT TITLE

Physical Attributes Only

- Material
- Finish
- Colour
- Dimensions



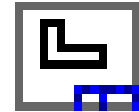
Component CAD Model

Number: **184786**

Version: **A**.I (A is Alfa)

Name: COMPONENT TITLE

File Name: **184786.prt**
(number + ext)



Component CAD Drawing (Optional)

Number: **184786**

Version: **A**.I (A is Alfa)

Name: COMPONENT TITLE

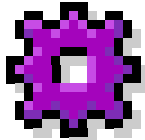
File Name: **184786.drw**
(number + ext)

Attributes:

- Material
- Finish
- Colour
- RoHS

Example of a Standardized **Component** Part, CAD Model and Drawing

Drawing Text Change (No Fit, Form & Function Change) after Release



Part Representation

Number: **184786**

Version: -.I (- **no revision**)

Name: COMPONENT TITLE

Physical Attributes Only

- Material
- Finish
- Colour
- Dimensions



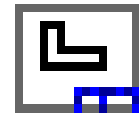
Component CAD Model

Number: **184786**

Version: **A**.I (A is Alfa)

Name: COMPONENT TITLE

File Name: **184786**.prt
(number + ext)



Component CAD Drawing

Number: **184786**

Version: **B**.I (A is Alfa)

Name: COMPONENT TITLE

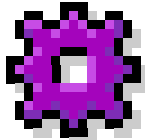
File Name: **184786**.drw
(number + ext)

Attributes:

- Material
- Finish
- Colour
- RoHS

Example of a Standardized **Component** Part, CAD Model and Drawing

Fit or Form Change after Release



Part Representation

Number: **new number**

Version: **-.I (- no revision)**

Name: COMPONENT TITLE

Physical Attributes Only

- Material
- Finish
- Colour
- Dimensions



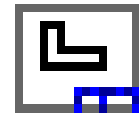
Component CAD Model

Number: **new number**

Version: **A.I (A is Alfa)**

Name: COMPONENT TITLE

File Name: **new number.prt**
(number + ext)



Component CAD Drawing (Optional)

Number: **new number**

Version: **A.I (A is Alfa)**

Name: COMPONENT TITLE

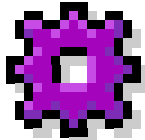
File Name: **new number.drw**
(number + ext)

Attributes:

- Material
- Finish
- Colour
- RoHS

Standardized **Assembly** Part, CAD and Drawing Nomenclature Methodology

Initial Release



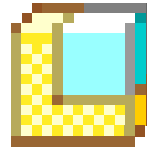
Assembly Part Representation

Number: 136814-101

Version: **A.3** (Alpha revision sequence for assemblies)

Name: COMPONENT TITLE

BOMs:



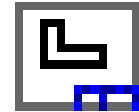
CAD Assembly Model

Number: 136814-101

Version: **A.1**

Name: COMPONENT TITLE

File Name: 136814-101.asm



CAD Drawing

Number: 136814-101

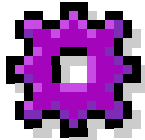
Version: **A.1**

Name: COMPONENT TITLE

File Name: 136814-101.drw

Standardized **Assembly** Part, CAD and Drawing Nomenclature Methodology

Drawing Text Change (No Fit, Form & Function Change) after Release



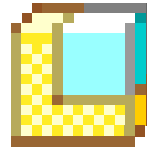
Assembly Part Representation

Number: 136814-101

Version: **A.3** (Alpha revision sequence for assemblies)

Name: COMPONENT TITLE

BOMs:



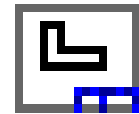
CAD Assembly Model

Number: 136814-101

Version: **A.1**

Name: COMPONENT TITLE

File Name: 136814-101.asm



CAD Drawing

Number: 136814-101

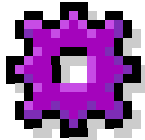
Version: **B.1**

Name: COMPONENT TITLE

File Name: 136814-101.drw

Standardized **Assembly** Part, CAD and Drawing Nomenclature Methodology

Component change resulting in a new assembly number



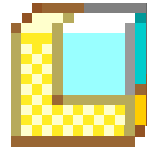
Assembly Part Representation

Number: **new number**

Version: **A.3** (Alpha revision sequence for assemblies)

Name: COMPONENT TITLE

BOMs:



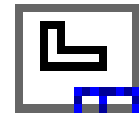
CAD Assembly Model

Number: **new number**

Version: **A.1**

Name: COMPONENT TITLE

File Name: **new number.asm**



CAD Drawing

Number: **new number**

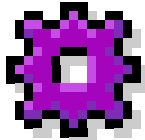
Version: **A.1**

Name: COMPONENT TITLE

File Name: **new number.drw**

Standardized **Assembly** Part, CAD and Drawing Nomenclature Methodology

Resulting change in next higher assembly revision



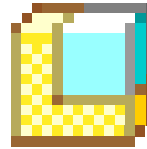
Assembly Part Representation

Number: #####

Version: **B.3** (Alpha revision
sequence for assemblies)

Name: COMPONENT TITLE

BOMs:



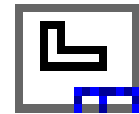
CAD Assembly Model

Number: #####

Version: **B.1**

Name: COMPONENT TITLE

File Name: #####.asm



CAD Drawing

Number: #####

Version: **B.1**

Name: COMPONENT TITLE

File Name: #####.drw

Advantages of Standardized Methodology with PLM

- **Visible standard changes in the organization with fit, form and function**
- **Alignment with current bin numbering in MFG**
- **PLM can provide better controls to enforce this methodology with workaround in different PLM libraries and subfolders**